We claim,

1. An SPS system for identifying the location of a receiver in the presence of satellite signal attenuation comprising:

a plurality of orbital satellites sending synchronized encoded signals on a carrier frequency wherein said encoded signals have repeated epochs containing synchronization data;

a receiver for detecting, acquiring, tracking a set of the encoded signals and simultaneously determining the code phases of said set with respect to said epochs;

an aiding source to transmit information to the SPS system, and;

a processor executing an algorithm for computing an initial approximate location from measured satellite Doppler differences.

2. The SPS system for identifying the location of a receiver in the presence of satellite signal attenuation of claim 1 wherein the receiver has a local oscillator and the algorithm executed by the processor has no dependence on a current local oscillator offset.

3. A method for identifying the location of a receiver in the presence of satellite signal attenuation of claim 1 wherein an SPS system executes a Doppler positioning algorithm comprising the steps of

applying space vehicle (SV) clock corrections to both the satellite time of transmit and the satellite Doppler frequency for each input observation made by the GPS receiver.

calculating satellite positions at the corrected satellite time of transmit

estimating the receiver location,

iterating through the following steps until a residual error in receiver location is below a predetermined criteria,

determining an estimate of the satellite range-rate.

correcting the current estimate of the user position.

4. An SPS system for identifying the location of a receiver in the presence of satellite signal attenuation comprising:

a plurality of orbital satellites sending synchronized encoded signals on

a carrier frequency wherein said encoded signals have repeated epochs containing synchronization data;

a receiver for detecting, acquiring, tracking a set of the encoded signals and simultaneously determining the code phases of said set with respect to said epochs;

an aiding source to transmit information to the SPS system,

a local oscillator in the receiver,

an algorithm executed by a processor in the receiver, said algorithm calibrating the local oscillator by counting local oscillator cycles and fractions thereof over a period precisely determined by a number of signal framing intervals.

5. The method of calibrating a local oscillator of an SPS receiver comprising the steps of counting local oscillator cycles and fractions thereof over a period precisely determined by a number of signal framing intervals, calculating a calibration offset and using the calibration offset as a correction by the SPS receiver firmware when performing acquisition searches.

6. A method of calibrating a local oscillator of an SPS receiver comprising the steps of counting local oscillator cycles and fractions thereof over a period precisely determined by a number of signal framing intervals, calculating a calibration offset and using the calibration offset to correct the oscillator frequency

7. The method of calibrating a local oscillator of an SPS receiver of claim 6, wherein the calibration offset is used to correct the oscillator frequency so as to minimize the offset.

8. An SPS system for identifying the location of a receiver in the presence of satellite signal attenuation comprising:

a plurality of orbital satellites sending synchronized encoded signals on a carrier frequency wherein said encoded signals have repeated epochs containing synchronization data;

a receiver for detecting, acquiring, tracking a set of the encoded signals

and simultaneously determining the code phases of said set with respect to said epochs;

an aiding source to transmit information to the SPS system,

a canceler for reducing the amplitude of strong signals wherein the canceler is integrated into a correlator.

9. The SPS system for identifying the location of a receiver of claim 8, wherein a canceling finger is provided for each channel for which canceling is to be performed and said canceling finger takes one input from the code generator input to a prompt finger of a channel tracking a jamming signal and a second input from a code generator input of the finger for which cancellation is to be performed.

10. The SPS system for identifying the location of a receiver of claim 8 wherein the cancellation is performed at a point where the signal is represented by approximately 10 bits.

11. An SPS system for identifying the location of a receiver in the presence of satellite signal attenuation comprising:

a plurality of orbital satellites sending synchronized encoded signals on a carrier frequency wherein said encoded signals have repeated epochs containing synchronization data;

a receiver for detecting, acquiring, tracking a set of the encoded signals and simultaneously determining the code phases of said set with respect to said epochs;

an aiding source to transmit information to the SPS system,

a processor controlling a program to extract a signal power spectrum from the noise by averaging, wherein said program executes a FFT in which squared magnitudes of the FFT bins are filtered.

12. The SPS system for identifying the location of a receiver of claim 11 in which the system dwells for several FFT periods at each code search step.

13. The SPS system for identifying the location of a receiver of claim 11 in which the system applies 1/Nth of the normal search step size for N-fold

averaging each FFT period.

14. An SPS system for identifying the location of a receiver in the presence of satellite signal attenuation comprising:

a plurality of orbital satellites sending synchronized encoded signals on a carrier frequency wherein said encoded signals have repeated epochs containing synchronization data;

a receiver for detecting, acquiring, tracking a set of the encoded signals and simultaneously determining the code phases of said set with respect to said epochs;

an aiding source to transmit information to the SPS system, and algorithm running in a processor that extracts the signal power spectrum from the noise by averaging.

15. The SPS system for identifying the location of a receiver of claim 14, wherein the system runs a filter on the squared magnitude of an autoconvolution array for each channel.

16. An SPS system for identifying the location of a receiver in the presence of satellite signal attenuation comprising:

a plurality of orbital satellites sending synchronized encoded signals on a carrier frequency wherein said encoded signals have repeated epochs containing synchronization data;

a receiver for detecting, acquiring, tracking a set of the encoded signals and simultaneously determining the code phases of said set with respect to said epochs; and

hardcoded orbital coefficients for a number of the most common satellite orbits in a lookup table.

17. A method for updating almanac data in an SPS receiver comprising hardcoding orbital coefficients for a number of the most common satellite orbits in a lookup table and broadcasting updates from an aiding source.

18. An SPS system for identifying the location of a receiver in the presence

of satellite signal attenuation comprising:

a plurality of orbital satellites sending synchronized encoded signals on a carrier frequency wherein said encoded signals have repeated epochs containing synchronization data;

a receiver for detecting, acquiring, tracking a set of the encoded signals and simultaneously determining the code phases of said set with respect to said epochs; and

a processor running an algorithm for obtaining full time-of-transmit from a partial code phase, a reference time stamp and an estimate of the location of the receiver.

19. An SPS system for identifying the location of a receiver in the presence of satellite signal attenuation comprising:

a plurality of orbital satellites sending synchronized encoded signals on a carrier frequency wherein said encoded signals have repeated epochs containing synchronization data;

a receiver for detecting, acquiring, tracking a set of the encoded signals and simultaneously determining the code phases of said set with respect to said epochs; and

a search engine having a search range of at least 60 chips after acquisition of the first satellite.